CSE 4510: Section C
IPC Online, Marks 15, Time 45 minutes

Consider a scenario where a bus picks up waiting passengers from a bus stop periodically. The bus has a capacity of K. The bus arrives at the bus stop, allows up to K waiting passengers (fewer if less than K are waiting) to board, and then departs. Passengers have to wait for the bus to arrive and then board it. Passengers who arrive at the bus stop after the bus has arrived should not be allowed to board, and should wait for the next time the bus arrives.

The bus and passengers are represented by threads in a program. The passenger thread should call the function board() after the passenger has boarded and the bus should invoke depart() when it has boarded the desired number of passengers and is ready to depart.

The output may look something like this:

```
anik@DESKTOP-IE3PQ9M:/mnt/d/My courses/IPC Online$ ./a.out
Bus: Arrived at the bus stop. Waiting passengers: 0
Bus: Departing with 0 passengers.
Passenger 1: Waiting at the bus stop.
Passenger 2: Waiting at the bus stop.
Passenger 3: Waiting at the bus stop.
Bus: Arrived at the bus stop. Waiting passengers: 3
Passenger 2: Boarded the bus.
Passenger 1: Boarded the bus.
Passenger 3: Boarded the bus.
Bus: Departing with 3 passengers.
Passenger 4: Waiting at the bus stop.
Passenger 5: Waiting at the bus stop.
Passenger 6: Waiting at the bus stop.
Passenger 7: Waiting at the bus stop.
Passenger 8: Waiting at the bus stop.
Passenger 9: Waiting at the bus stop.
Bus: Arrived at the bus stop. Waiting passengers: 6
Passenger 8: Boarded the bus.
Passenger 9: Boarded the bus.
Passenger 5: Boarded the bus.
Passenger 7: Boarded the bus.
Passenger 4: Boarded the bus.
Bus: Departing with 5 passengers.
Passenger 6: Boarded the bus.
Passenger 10: Waiting at the bus stop.
Bus: Arrived at the bus stop. Waiting passengers: 1
Passenger 10: Boarded the bus.
Bus: Departing with 2 passengers
```